

CLAIMS

1. An isolated or recombinant nucleic acid of SEQ ID NO 1 or SEQ ID NO 9 or a functional equivalent or functional fragment thereof, said functional equivalent or functional fragment thereof encoding an Apoptin-associating proteinaceous substance capable of causing apoptosis in a cell to which said isolated or recombinant nucleic acid or Apoptin-associating proteinaceous substance has been delivered.

2. The isolated or recombinant nucleic acid of claim 1 wherein said isolated or recombinant nucleic acid is derived from a cDNA library.

3. The isolated or recombinant nucleic acid of claim 2 wherein said cDNA library is a human cDNA library.

4. The isolated or recombinant nucleic acid of any one of claims 1 to 3 capable of hybridizing to a nucleic acid molecule encoding an Apoptin-associating proteinaceous substance as shown in SEQ ID NO 2 or SEQ ID NO 10.

5. The isolated or recombinant nucleic acid of any one of claims 1 to 4, wherein said isolated or recombinant nucleic acid is at least 60% homologous to the nucleic acid molecule of SEQ ID NO 1, SEQ ID NO 9, or SEQ ID NO 1 and SEQ ID NO 9.

6. A vector comprising an isolated or recombinant nucleic acid of SEQ ID NO 1 or SEQ ID NO 9 or a functional equivalent or functional fragment thereof, said functional equivalent or functional fragment thereof encoding an Apoptin-associating proteinaceous substance capable of causing apoptosis in a cell to which said isolated or recombinant nucleic acid or Apoptin-associating proteinaceous substance has been delivered.

7. The vector of claim 6 wherein said vector comprises a gene-delivery vehicle.

8. A host cell having an isolated or recombinant nucleic acid of SEQ ID NO 1 or SEQ ID NO 9 or a functional equivalent or functional fragment thereof, said functional equivalent or functional fragment thereof encoding an Apoptin-associating proteinaceous substance capable of causing apoptosis in a cell to which said isolated or recombinant nucleic acid or Apoptin-associating proteinaceous substance has been delivered.

9. The host cell of claim 8 wherein said cell is a eukaryotic cell.

10. An isolated or recombinant Apoptin-associating proteinaceous substance comprising a sequence as shown in SEQ ID NO 2 or SEQ ID NO 10 or a functional equivalent or functional fragment thereof capable of causing apoptosis in a cell to which said proteinaceous substance has been administered.

11. The proteinaceous substance of claim 10 encoded by the nucleic acid of any one of claims 1 to 5.

sub 2 12. The proteinaceous substance of claim 10 or claim 11, said proteinaceous substance comprising at least a part of an amino acid sequence as shown in ~~SEQ ID 2 or SEQ ID 10~~ or a functional equivalent or functional fragment thereof.

13. ~~An~~ isolated or synthetic antibody specifically recognizing a proteinaceous substance or functional equivalent or functional fragment thereof of any one of claims 10 to 12.

14. A proteinaceous substance specifically recognizable by an antibody according to claim 13.

15. A method of inducing apoptosis in a cell comprising administering to said cell an apoptosis inducing substance selected from the group consisting of:

an isolated or recombinant nucleic acid of SEQ ID NO 1 or SEQ ID NO 9 or a functional equivalent or functional fragment thereof, said functional equivalent or functional fragment thereof encoding an Apoptin-associating proteinaceous substance capable of causing apoptosis in a cell to which said isolated or recombinant nucleic acid or Apoptin-associating proteinaceous substance has been delivered,

a vector comprising an isolated or recombinant nucleic acid of SEQ ID NO 1 or SEQ ID NO 9 or a functional equivalent or functional fragment thereof, said functional equivalent or functional fragment thereof encoding an Apoptin-associating proteinaceous substance capable of causing apoptosis in a cell to which said isolated or recombinant nucleic acid or Apoptin-associating proteinaceous substance has been delivered,

a host cell transformed with an isolated or recombinant nucleic acid of SEQ ID NO 1 or SEQ ID NO 9 or a functional equivalent or functional fragment thereof, said functional equivalent or functional fragment thereof encoding an Apoptin-associating proteinaceous substance capable of causing apoptosis in a cell to which said isolated or recombinant nucleic acid or Apoptin-associating proteinaceous substance has been delivered,

an isolated or recombinant Apoptin-associating proteinaceous substance comprising a sequence as shown in SEQ ID NO 2 or SEQ ID NO 10 or a functional equivalent or functional fragment thereof capable of causing apoptosis in a cell to which said proteinaceous substance has been administered, and mixtures thereof.

16. The method according to claim 15 wherein said apoptosis is p53-independent.

17. A pharmaceutical composition for use in a subject, said pharmaceutical composition comprising:

a pharmaceutically acceptable amount of a component selected from the group consisting of:

an isolated or recombinant nucleic acid of SEQ ID NO 1 or SEQ ID NO 9 or a functional equivalent or functional fragment thereof, said functional equivalent or functional fragment thereof encoding an Apoptin-associating proteinaceous substance capable of causing apoptosis in a cell to which said isolated or recombinant nucleic acid or Apoptin-associating proteinaceous substance has been delivered,

a vector comprising an isolated or recombinant nucleic acid of SEQ ID NO 1 or SEQ ID NO 9 or a functional equivalent or functional fragment thereof, said functional equivalent or functional fragment thereof encoding an Apoptin-associating proteinaceous substance capable of causing apoptosis in a cell to which said isolated or recombinant nucleic acid or Apoptin-associating proteinaceous substance has been delivered,

a host cell transformed with an isolated or recombinant nucleic acid of SEQ ID NO 1 or SEQ ID NO 9 or a functional equivalent or functional fragment thereof, said functional equivalent or functional fragment thereof encoding an Apoptin-associating proteinaceous substance capable of causing apoptosis in a cell to which said isolated or recombinant nucleic acid or Apoptin-associating proteinaceous substance has been delivered,

an isolated or recombinant Apoptin-associating proteinaceous substance comprising a sequence as shown in SEQ ID NO 2 or SEQ ID NO 10 or a functional equivalent or functional fragment thereof capable of causing apoptosis in a cell to which said proteinaceous substance has been administered, and

mixtures thereof.

said component together with a pharmaceutically acceptable carrier, acceptable and compatible for said subject and said component.

18. The pharmaceutical composition of claim 17 wherein said further comprising:
a nucleic acid encoding Apoptin or a functional equivalent or fragment thereof or
Apoptin or a functional equivalent or fragment thereof.

19. A method for treating a subject having a disease wherein enhanced cell proliferation
or decreased cell death is observed, said method comprising treating the subject with the
pharmaceutical composition comprising:

a pharmaceutically acceptable amount of a component selected from the group
consisting of:

an isolated or recombinant nucleic acid of SEQ ID NO 1 or SEQ ID NO 9 or
a functional equivalent or functional fragment thereof, said functional equivalent
or functional fragment thereof encoding an Apoptin-associating proteinaceous
substance capable of causing apoptosis in a cell to which said isolated or
recombinant nucleic acid or Apoptin-associating proteinaceous substance has been
delivered.

a vector comprising an isolated or recombinant nucleic acid of SEQ ID NO
1 or SEQ ID NO 9 or a functional equivalent or functional fragment thereof, said
functional equivalent or functional fragment thereof encoding an Apoptin-
associating proteinaceous substance capable of causing apoptosis in a cell to which
said isolated or recombinant nucleic acid or Apoptin-associating proteinaceous
substance has been delivered.

a host cell transformed with an isolated or recombinant nucleic acid of SEQ
ID NO 1 or SEQ ID NO 9 or a functional equivalent or functional fragment thereof,
said functional equivalent or functional fragment thereof encoding an Apoptin-
associating proteinaceous substance capable of causing apoptosis in a cell to which
said isolated or recombinant nucleic acid or Apoptin-associating proteinaceous
substance has been delivered.

an isolated or recombinant Apoptin-associating proteinaceous substance
comprising a sequence as shown in SEQ ID NO 2 or SEQ ID NO 10 or a functional

equivalent or functional fragment thereof capable of causing apoptosis in a cell to which said proteinaceous substance has been administered, and

mixtures thereof,

together with a pharmaceutically acceptable carrier, acceptable for said subject and said component to induce apoptosis.

20. The method according to claim 19 wherein said disease comprises cancer or autoimmune disease.

21. The method according to claim 19 wherein said apoptosis is p53-independent.